What is claimed is:

1. An improved therapy to prevent premature labor or improve the outcome of premature labor in a pregnant animal, said therapy comprising:

administering a free radical scavenger, a precursor thereto, or an agent inducing

production of endogenous free radical scavenger, in an effective amount to

said pregnant animal.

5

2. The improved therapy of Claim 1 further comprising:

administration of an antibacterial agent to said pregnant animal.

3. The improved therapy of Claim 1 further comprising:

administration of tocolytic agent to said pregnant animal.

4. The improved therapy of Claim 1 wherein said free radical scavenger is glutathione or NAC.

5. The improved therapy of Claim 1 wherein said free radical scavenger is an antioxidant.

6. The improved therapy of Claim 1 wherein said free radical scavenger is a spin trapping compound.

7.   An improved therapy for preventing premature rupture of membranes in a pregnant animal comprising:

administering a free radical scavenger, an agent that induces production of an endogenous inhibitor of reactive oxygen species, nitric oxide, or the production thereof to said pregnant animal.

8.   The improved therapy of Claim 7 wherein the agent is a precursor of a free radical scavenger selected from the group consisting of glutathione, NAC, b-carotene, vitamin C and vitamin E.

9.   The improved therapy of Claim 7 wherein the agent is a precursor of a free radical scavenger that is an antioxidant.

10.   The improved therapy of Claim 7 wherein the agent is a precursor of a free radical scavenger and is a spin trapping compound.

11.   The improved therapy of Claim 7 wherein the endogenous inhibitor is superoxide dismutase, catalase, or glutathione peroxidase.

12.   An improved therapy for improving the outcome of preterm deliveries of a pregnant animal comprising:

administering at least one ROS-inhibiting compound, a precursor thereto, or an inducer thereof to the pregnant animal.

51

13.   The improved therapy of Claims 1, 7, or 12 wherein said animal is selected from a group consisting of monkeys, cows, sheep, chickens, horses, dogs, cats, and elephants.

14.   The improved therapy of Claims 1, 7, or 12 wherein said animal is mammal.

15.   The improved. therapy of Claims 1, 7, or 12 wherein said animal is a reptile.

16.   The improved therapy of Claims 1, 7, or 12 wherein said animal is an amphibian.

17.   The improved therapy of Claims 1, 7, or 12 wherein said animal is human.

18.   The improved therapy of Claims 1, 7, or 12 wherein said animal is a high risk patient selected from the group consisting of patients with a history of preterm labor, patients with preterm labor, cocaine users, preeclamptic patients and patients with PPROM.

19.   The improved therapy of Claims 1, 7, or 12 wherein at least one reactive free radical scavenger is selected from the group consisting of cysteine, glutathione, N-acetylcysteine, L-alpha-acetamido-beta mercaptopropionic acid, S-nitroso-glutathione, N–acetyl-3-mercapto-alanine, butylated hydroxyanisole, butylated hydroxytoluene, L-2-oxothiazolidine-4-carboxylate, vitamin C (ascorbate) and vitamin E (tocopherol), desferrioxamine, allopurinol, superoxide dismutase and salen-manganese complex superoxide dismutase mimetic.

DSH\BUH385\01003Aapp

20.   The improved therapy of Claims 1, 7, or 12 wherein at least one reactive free radical scavenger is a nitrone, nitroxide or salicylate.

21.   The improved therapy of Claim 20 wherein the nitrone is phenyl-butyl nitrone, or trimethoxyphenyl-butyl nitrone.

22.   A method for detecting *in utero* formation of free radicals capable of inducing fetal damage or leading to preterm labor, the method comprising:

administering a spin trap agent passable through the placental membrane and having

different magnetic resonance spectra before and after a free radical is trapped;

detecting by magnetic resonance imaging the location and amount of spin trapping

agents that have interacted with a free radical;

wherein the location and amount of free radical activated spin trapping agents shows

the presence and amount of free radical species.

DSH\BUH385\01003Aapp